

TWELFTH ANNUAL

REPORT 14

OF

Rutgers Scientific School,

THE STATE COLLEGE

FOR THE

BENEFIT OF AGRICULTURE AND MECHANIC ARTS,

FOR THE YEAR

1876

NEW BRUNSWICK, N. J.



TRENTON, N. J.:

JOHN L. MURPHY, STATE GAZETTE PRINTING HOUSE.

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JOHN L. MURPHY, BOOK AND JOB PRINTER.

1876.

BOARD OF VISITORS.

First Congressional District.

	<i>Residences.</i>	<i>Terms Expire.</i>
HON. THOMAS H. DUDLEY,	Camden,	April 12, 1878.
CHALKLEY ALBERTSON, Esq.,	Haddonfield,	April 12, 1878.

Second Congressional District.

HON. WILLIAM PARRY,	Cinnaminson,	April 12, 1877.
EDWARD J. C. ATTERBURY, Esq.,	Trenton,	April 12, 1878.

Third Congressional District.

JOSEPH W. YATES, Esq.,	Plainfield,	April 12, 1878.
HON. WILLIAM A. NEWELL,	Allentown,	April 12, 1878.

Fourth Congressional District.

HON. JOSEPH THOMPSON,	Readington,	April 12, 1877.
WM. R. JANEWAY, Esq.,	New Brunswick,	April 12, 1878.

Fifth Congressional District.

HON. HENRY C. PITNEY,	Morristown,	April 12, 1878.
REV. JOHN STEELE, D. D.,	Paterson,	April 12, 1877.

Sixth Congressional District.

FRANCIS H. DAWES, Esq.,	Newark,	April 12, 1878.
WILLIAM M. FORCE, Esq.,	Newark.	April 12, 1877.

Seventh Congressional District.

ABRAHAM W. DURYEA, Esq.,	New Durham,	April 12, 1878.
PETER HENDERSON, Esq.,	Jersey City,	April 12, 1878.

OFFICERS.

HON. WILLIAM PARRY, *Chairman.*
PROF. GEORGE H. COOK, *Secretary.*

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REPORT OF STATE BOARD OF VISITORS.

TWELFTH ANNUAL REPORT OF THE BOARD OF VISITORS OF THE STATE AGRICULTURAL COLLEGE.

To His Excellency, Joseph D. Bedle, Governor of the State of New Jersey :

SIR:—The Board of Visitors of the New Jersey State College of Agriculture and the Mechanic Arts beg leave to present their Twelfth Annual Report, as required by law :

Since the last report, this Board has held in accordance with the provisions of the law under which it is organized, two semi-annual meetings at the College in New Brunswick, and one meeting at the College Farm.

The first of these was held December 17, 1875, the second June 15, 1876, and the last October 25, 1876.

At the meeting in December, the members of the Board attended the examinations upon the subjects of study of the term then just ending. All the classes in the Institution were heard by them. Special praise was given to the classes in Drawing and Descriptive Geometry, and in French, and all the classes were approved.

A letter was received from David Pettit, a member of the Board, and was read. Mr. Pettit stated some of the questions in agriculture, which are as yet undecided, and which he recommended to be settled on the College Farm, and at public expense. One question was as to the proper depth for plowing, and another was in relation to the profit of making beet-sugar in New Jersey.

Mr. Pettit was one of the most intelligent, skillful and progressive farmers in the State, and his death which occurred soon after this, is to be deplored as a public loss.

The Secretary reported that of the forty State Scholarships in the Institution, twenty-four were filled and sixteen were vacant.

At the meeting in June, classes were examined by members of the Board in all their studies, and the two graduates Kuehne and Pierce, read their graduating Theses before them. A vote of approval was passed by the Board and the Theses were highly commended.

The meeting of the Board on the 25th of October, was held at the College Farm. The objects of this meeting were to inspect the farm, to examine its working, and to make such recommendations as seem best, to benefit the agriculture of our State.

The farm is in good condition, its crops are as large as the extraordinarily dry season would allow, its stock is fair, its barns and outbuildings are new and well adapted to their uses.

The act appropriating scrip for public lands granted to the State of New Jersey by the act of Congress approved July 2, 1862, was approved April 4, 1864. It directed the scrip to be sold by State officers, the proceeds to be invested, and the interest to be paid to the Trustees of Rutgers College, to be used *wholly and exclusively* for the maintenance of such courses of instruction as shall carry out the intent of the act of Congress, which was chiefly "to teach such branches of learning as relate to agriculture and the mechanic arts," and "to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." The act of New Jersey required the trustees to furnish instruction free to a limited number of students from the several counties of the State, to erect additional and adequate buildings as soon as the same may become necessary, without charge to or upon the State, and in like manner to furnish and provide a suitable tract of land, conveniently located for an experimental farm. It also prescribed the mode of appointment of the Visitors, made it their duty to visit said college at least twice in each year and report thereon to the Legislature, and it gave them general powers of supervision and control, with the requirement to report to the Legislature such recommendations as to them may seem proper.

Under this act the scrip was sold, and the proceeds, which amounted to nearly \$116,000, were invested in New Jersey six per cent. State bonds, and the annual interest amounting to \$6,960 is regularly paid to the Treasurer of Rutgers College. The trustees have established courses of instruction and employed a Professor of Civil Engineering, a Professor of Analytical Chemistry, a Professor of Mathematics and Drawing, and a Professor of Agriculture. They have also provided for instruction in the College classes in French, German, Rhetoric, Composition, Declamation, in Natural Philosophy, Chemistry, Botany, Miner-

alogy, Geology and Natural History. They have also established forty county scholarships in which no tuition fees are required.

They have provided additional and adequate buildings by enlarging the original college structure, by erecting a large Geological Hall containing rooms for collections of minerals, fossils, &c., and for working laboratories; by building a large and commodious chapel and library, and an astronomical observatory. They have also provided and furnished a farm of one hundred acres, with all the land cleared, drained and in good order, and with sufficient and suitable buildings and stock, and it is in use as an experimental farm.

The Board of Visitors has been appointed and has made regular visits twice a year to the institution and has made eleven annual reports to the Legislature.

The first graduates went out in 1868 and since then a class has gone out every year except 1874, when on account of the change in the course of study from three to four years, there was none. The whole number graduated is sixty-seven, but a much larger number has been in attendance. The institution has been successful in educating the industrial classes for their pursuits in life. The students have, with scarcely an exception, gone into occupations where practical science can be made useful, and are taking equal rank with educated professional men. They are civil engineers, mining engineers, mechanical engineers, architects, manufacturers, teachers, chemists, farmers, &c., &c.—Wherever educated industry can find its reward they seek employment, and every year is proving the worth of education for those who pursue the arts of common life. We consider this gift of the general government for the higher education of the industrial classes to be appropriate, timely, and well bestowed, and we shall be glad to join in asking our members of Congress to urge an enlargement of the nation's gift.

The Trustees of Rutgers College have fulfilled their engagements to the State and to the Agricultural College faithfully and liberally. They have expended more than \$100,000 in the erection and fitting up of the new buildings demanded for this extended course of instruction in liberal and scientific education. The income from the United States fund is less than the amount of the salaries paid to the professors in the scientific department of the college. The experimental farm has been a heavy expense, though it has been a success in showing the good effects of draining and improving wet, poor and stony ground. It has cost at least \$50,000 for its purchase, improvement, and equipment; but it is within the limits of New Brunswick, convenient of access, and is all in productive condition, and there is probably no farm in the State, if there is in the whole country, which has been so rapidly and thoroughly changed from absolute

worthlessness to a high state of cultivation. The experiments with crops, fertilizers, stock, implements, &c., are only begun, but they already furnish examples for imitation by others, and the publication of the analyses of the fertilizers used on the farm is producing an effect on the practice of farmers throughout the State.

Arts which require manual skill and are only acquired by long practice must be learned in private. Ambitious young men will not show their ignorance or want of skill in public, neither can they make their best efforts when others are looking on. No students come here to learn the practice of farm work. They come to learn the sciences on which agriculture and the mechanic arts depend for their successful prosecution, and then go out and engage in such industries as their business relations, tastes or opportunities afford them, and every calling in life gets a share according to its presumed advantages.

The Agricultural Colleges were established to furnish a liberal and scientific education for farmers and mechanics. Whether this was to be done by training students where manual labor was to be combined with study, was an unsettled question, and earnest advocates were found for either side of the question. But experience is gradually settling this particular question as it has so many others before, and proving that no one can well do more than one thing at a time. Occasionally a young man who has previously acquired skill in working, may continue to follow his trade while learning to study and to use his mental powers to advantage; but the cases are very uncommon in which young persons can learn to study and to work at the same time.

The old methods of learning to study books, to find out what has been said and done by those who have gone before us, and to cultivate our own powers of thinking, speaking and writing must still be pursued. The methods of learning from observation and experiment are the additions which have been made to liberal education in modern times; and it is the study of these which has given the wonderful advancement to sciences and arts in our day. But to learn these profitably the student must first learn how to study; so that we come back to the conclusion that generally the course of educational studies is nearly the same for all. Professional studies will of course be more specific. And for practical life, after the educational studies are ended, the engineer, the manufacturer, the working chemist, the managing farmer or the successful mechanic must serve a kind of apprenticeship under the direction of some skilled and practical man in his specialty, before he can safely undertake work in which money, time and reputation are at stake.

The way in which education and science are to benefit agriculture, is becoming better understood. Experiment stations,

at which the unsettled questions in farming may be answered, are meeting the approval of farmers in all countries. One of the first stations of this kind was established in England, by Mr. J. B. Lawes, more than thirty years ago. Another was started by Boussingault, in eastern France, at about the same time. But the Germans first established one under government patronage in 1851. Since that time a large number of others have been established. At the present time there are about seventy of them; some in each of the countries of Europe, but most of them in Germany. At these stations experiments are conducted for various ends. Some control and certify to the composition of commercial fertilizers. Some are devoted to the action of special manures on different crops. Others study the economy of feeding animals. Beets and beet sugar are the study of others. The production of silk or of grapes is the specialty of a few, while several of such objects are combined in many of them. They have met with general approval wherever established.

Their expenses, which amount to from \$1,000 to \$5,000 or more a year, are borne, some by government, and others by individuals or associations. And their benefits, both in protecting from fraud or ignorance in regard to fertilizers, and in giving intelligent direction to industry, are considered to be worth vastly more than they cost. The State of Connecticut has established an experiment station at Middletown, under the direction of Prof. W. O. Atwater, with assistants, and appropriates \$2800 a year to its support. The Bussey Institution near Boston, and connected with Harvard College is also conducted as an experiment station, and is supported by the bequest of its founder.

At all these stations the investigations are conducted by learned and practical men, and their work is made public through the press. Students are not received except as assistants.

The New Jersey Agricultural College can do most for the direct benefit of farmers by conducting the College Farm as an agricultural experiment station. Maine, Massachusetts, Connecticut, Pennsylvania, Delaware, Maryland, Virginia and several of the Southern and Western States have supplemented the Government gift to the Agricultural Colleges by liberal donations from the State treasuries. New Jersey has not as yet given anything to foster this valuable institution. Now that it is proved a success, and when aid will materially increase its usefulness, we think this aid should be liberally given.

In concluding our annual report, we recommend that the sum of three thousand dollars a year be paid by the State to the Trustees of Rutgers College, for the expenses of conducting

agricultural experiments at the College Farm. We also recommend that the Comptroller be authorized to pay such bills for advertising vacant scholarships, examinations and information regarding the Agricultural College as may best bring its advantages to the knowledge of all our people.

JOHN STEELE,
EDW. J. C. ATTERBURY,
CHALKLEY ALBERTSON,
WM. R. JANEWAY,
WM. M. FORCE,
ABM W. DURYEA,
WILLIAM PARRY,
THOMAS H. DUDLEY,
WILLIAM A. NEWELL.

TRUSTEES' REPORT.

RUTGERS COLLEGE,
NEW BRUNSWICK, N. J., Nov. 17, 1876. }

To His Excellency, Joseph D. Bedle, Governor of the State of New Jersey:

SIR: I beg leave, in behalf of the Trustees of Rutgers College, to submit the twelfth annual report of Rutgers Scientific School, in compliance with the requirements of the act of Congress, approved July 2d, 1862, and of the act of the Legislature of the State of New Jersey, approved April 4th, 1864.

There have been no changes during the past year, either in the general policy of the institution, or in the composition of the Faculty.

I. FACULTY OF RUTGERS SCIENTIFIC SCHOOL.

The Faculty is now constituted as follows:

Rev. Wm. H. Campbell, D. D., LL. D., President, and Professor of Moral Philosophy.

George H. Cook, Ph. D., LL. D., Vice President, and Professor of Chemistry, Natural History and Agriculture.

David Murray, Ph. D., LL. D., Professor of Natural Philosophy and Astronomy.

Rev. Theodore S. Doolittle, D. D., Professor of Rhetoric, Logic, and Mental Philosophy.

John C. Smock, A. M., Professor of Mining and Metallurgy.

George W. Atherton, A. M., Professor of History, Political Economy and Constitutional Law.

Rev. Carl Meyer, D. D., Professor of French and German.

Francis C. Van Dyck, A. M., Professor of Analytical Chemistry.

Edward A. Bowser, M. S., C. E., Professor of Mathematics and Engineering.

Charles G. Rockwood, A. M., Ph. D., Professor of Natural Philosophy and Astronomy.

Isaac E. Hasbrouck, A. M., Adjunct Professor of Mathematics and Graphics.

II. COURSES OF STUDY AND DEGREES.

The courses of study in the Scientific School are as follows :

1. *A course of four years, in Civil Engineering and Mechanics.*
2. *A course of four years, in Chemistry and Agriculture.*
3. *A special course of two years, in Chemistry.*

The special course in Chemistry is intended for the convenience of students who wish to devote themselves exclusively to that branch of study. Ample facilities are provided for them in the Laboratory and Lecture Rooms for the full employment of their time, and, on completing the course, they receive a certificate to that effect.

Provision is also made for PARTIAL STUDENTS, who may enter at any time, and elect, under the advice and direction of the Faculty, such studies as they may be found qualified to pursue, with classes already formed. Such students are subject to the general regulations and discipline of the institution. They are required to have their time fully occupied, and to pass such examinations as may be prescribed in each case. On leaving, they receive certificates, stating the studies pursued, and the amount of work performed in each.

The two principal courses cover a period of four years each. The studies of the first two years are the same in both, and are arranged with special reference to the wants of young men who desire to fit themselves to become land surveyors, or to enter any department of skilled industry, but are unable to remain four years in the institution. Students who leave at the end of this short course, receive certificates.

At the end of the two years' course, students elect whether to pursue the course in Civil Engineering and Mechanics, or that in Chemistry and Agriculture, and for the remaining two years their studies are directed with particular reference to the choice made. Some studies, however, of a general nature, such as History, English Literature, Political Economy, Moral Philosophy and others, are interspersed throughout the entire four years, in order that students may not only acquire a thorough preparation for their special pursuits in life, but may at the same time receive a liberal training which will fit them to discharge wisely and usefully, the duties of good citizenship.

Students completing either of the four years' courses, receive the degree of Bachelor of Science.

Graduates of three years' standing, receive the degree of Master of Science, in course.

The degrees of Civil Engineer and Doctor of Philosophy are conferred for distinguished professional success, or, on examination in prescribed subjects.

A schedule of the several courses of study accompanies this report.

III. TERMS OF ADMISSION.

The conditions of admission to the regular courses of study remain the same as for the last four years.

Applicants must be sixteen years of age, and of good moral character, and, if coming from other institutions, must bring certificate of honorable dismission. They must pass a satisfactory examination in English Grammar and Spelling, Geography (descriptive,) Physical Geography, History of the United States, Arithmetic, Algebra to Equations of the second degree, and Three Books of Plane Geometry.

The regular examinations for admission to the Freshman Class are held on Saturday and Monday preceding the annual commencement, and on the day before the opening of the Fall term. Candidates for advanced standing are examined in the preparatory studies, and in those already pursued by the class which they propose to enter.

IV. STUDENTS AND STUDIES.

The classes now in the institution are: first, the Senior Class, organized in September, 1873, which will be graduated in June, 1877; second, the Junior Class, organized in September, 1874, which will be graduated in June, 1878; third, the Sophomore Class, organized in September, 1875, which will be graduated in June, 1879; fourth, the Freshman Class, organized in September, 1876, which will be graduated in June, 1880.

The Senior Class now consists of fourteen students; the Junior Class of eight students; the Sophomore Class of eleven students; and the Freshman Class of twelve students; making a total of forty-five now in attendance.

There have been in the institution, during the year fifty-four students, of whom two were from Japan, one from England, five from the State of New York, one from the State of Illinois, one from the District of Columbia, and the remaining forty-four from the State of New Jersey, representing thirteen counties, as follows:

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Atlantic,	-	-	-	1	Morris,	-	-	-	-	2
Bergen,	-	-	-	1	Passaic,	-	-	-	-	1
Essex,	-	-	-	5	Somerset,	-	-	-	-	2
Hunterdon,	-	-	-	1	Sussex,	-	-	-	-	1
Mereer,	-	-	-	1	Union,	-	-	-	-	8
Middlesex,	-	-	-	19	Warren,	-	-	-	-	1
Monmouth,	-	-	-	2						

Under the law of New Jersey, designating this institution as "the State College for the benefit of Agriculture and the Meehanic Arts," forty students from this State are entitled to be received into the Scientific School, and remain through the entire course free of expense for tuition. These students are admitted on the recommendation of the superintendent of schools in each county, and are distributed among the counties in proportion to representation in the legislature, as follows :

Atlantic,	-	-	-	1	Middlesex,	-	-	-	2
Bergen,	-	-	-	1	Monmouth,	-	-	-	2
Burlington,	-	-	-	3	Morris,	-	-	-	2
Camden,	-	-	-	2	Ocean,	-	-	-	1
Cape May,	-	-	-	1	Passaic,	-	-	-	2
Cumberland,	-	-	-	1	Salem,	-	-	-	1
Essex,	-	-	-	6	Somerset,	-	-	-	1
Gloucester,	-	-	-	1	Sussex,	-	-	-	1
Hudson,	-	-	-	6	Union,	-	-	-	2
Hunterdon,	-	-	-	1	Warren,	-	-	-	1
Mercer,	-	-	-	2					

The trustees have not, however, in discharging their trust, confined themselves to a mere fulfillment of the requirements of the law, but have remitted tuition every year to a considerable number of young men in addition to those holding State scholarships. They have also, in cases where a scholarship was not filled by the county entitled to it, allowed it to be filled temporarily, with the consent of the County Superintendent, by an applicant from some other county.

In concluding this report, we desire to call attention to the following points :

1. The trustees feel justified in saying that the progress of the institution during the past year has been highly gratifying and satisfactory. There has been increased diligence, good order and fidelity on the part of the students, and an appreciable elevation of the whole tone and standard of scholarship.

2. The practical results of the methods of instruction here pursued have shown themselves in a variety of striking and important ways. Some of our students have, during portions

of the year, been engaged as assistants in the Topographical Survey of the State which has been carried on in connection with the United States Coast Survey. Others were employed for some months, under the direction of the State Geologist, in preparing the large and valuable exhibit of New Jersey minerals for the Centennial Exposition. The laboratory work of students in Analytical Chemistry has received the marked approval and commendation of proficients who have visited the rooms; and, in the judgment of members of the faculty who have visited other institutions extensively, their work will compare favorably with the best results elsewhere. The exhibit made by the College at the Centennial Exposition, which received an award from the judges, consisted to a considerable extent of maps, drawings, &c., prepared by students in the scientific department. It is proper to add, in this connection, that the department of drafting, under the able direction of Professor Hasbrouck, has become more useful and important than in any previous year.

3. It is only necessary to repeat what has been said in previous reports, that students who leave the institution find ready and remunerative employment in their various callings. Almost without exception they engage in some industrial pursuit, and, to a very large extent, they obtain situations in New Jersey, thus giving the fruits of their education directly back to the State from which they have received it.

4. Some of the County Superintendents of Schools have shown a praiseworthy interest in sending promising students to the institution. We cannot but express the hope that others, whether officially connected with the school system of the State or not, will think this a matter worthy of their intelligent interest and attention.

5. The Trustees continue to have the strong conviction which they have expressed on previous occasions, of the great practical usefulness of the institution, and, especially, of the policy which has here been adopted from the beginning, of combining the elements of a good general education with a careful attention to technical studies. Pursuing this general plan, they can only express for themselves and the Faculty their desire and purpose to increase the efficiency of the institution by every means in their power.

THE AGRICULTURAL DEPARTMENT AND STATE FUND.

The operations of the Agricultural Department are fully set forth in the report of the Professor of Agriculture, to which your attention is respectfully invited. The careful experiments conducted on the College Farm are every year becoming more

valuable and more highly appreciated by intelligent farmers, as well as by scientific investigators.

The amount of money received from the State Treasurer for the fiscal year ending October 31st, 1876, is six thousand nine hundred and sixty dollars, (\$6,960), which has been expended, as the law requires, exclusively for the salaries of professors in the Scientific School.

Respectfully submitted,

WM. H. CAMPBELL,

President of the Board of Trustees.

REPORT ON THE COLLEGE FARM.

ANNUAL REPORT ON THE STATE AGRICULTURAL COLLEGE FARM, FOR THE YEAR 1875-6.

BY GEORGE H. COOK.

The year which is now closing has been characterized by a drought of unexampled severity. This has affected all the operations of the farm. The ordinary rain fall at New Brunswick is shown in the following table, for which the records up to 1869 were made at Rutgers College, and the later ones by P. Vanderbilt Spader, Esq., at his residence, corner of George and Church streets, New Brunswick; and those for this year have been made at the College Farm.

The average yearly rain-fall in New Brunswick is 46.1 inches, and the smallest in twenty-two years preceding this was 33.35 inches, in 1858, while this year from September 1, 1875 to September 1, 1876, is only 29.35 inches. The peculiar dryness of the season will be better appreciated when it is observed that the winter of 1875-6 was unusually dry, most of the winter months showing much less than the average rain-fall, so that the season was begun with less water in the soil than is usual; and from the first of April to the present time, November 2, there has not been a time when sod-soil was too wet to plough. The rain-fall from April 1 to September 1, was 8.03 inches—while that of 1858, the same months which were next to the present in dryness, was 13.9 inches. But the severity of the drouth becomes plainer by comparing the rain-fall of the three hot months of June, July and August. The average from the table for those three months is 14.03 inches and the smallest amount recorded for them up to this year was 6.09 inches in 1858; this year the whole rain fall for the same months was only 3.17 inches.

Crops began to suffer from the drouth in the latter part of June, and there were no rains to do any good from that time till September 17, when a soaking rain fell and vegetation started. The drouth has been felt over a wide extent of country, but the damage has been generally less than about New Brunswick, from its not beginning quite so early.

The later hay crop was shortened, oats were materially injured, potatoes were destroyed, corn, which stands common drouths well, was so affected that the stalks were of only half the common height, and the corn crop was only about one fifth of the usual amount, the pastures were dried up, cabbage plants could not be set out, turnip seed would not sprout when planted, and the carrots and mangolds could make no growth. For lack of pasture or green fodder, we have been obliged to fodder and feed the cattle all through July and August. From the middle of September onwards the growth of vegetation has been rapid, but it was too late to retrieve the losses of the summer, or to bring to life again the young timothy and clover that had dried up. Farming in such seasons is attended with heavy losses, and to those who have only the single season's returns for their work, it is ruinous.

CROPS.

The crops of wheat and rye were very good. They are not yet threshed out. Some portions of the wheat were winter killed, but the average for fourteen acres of not very good ground is about 25 bushels an acre, though some experiment plots on the same field yielded 40 to 48 bushels per acre.

The variety of wheat grown is the Fultz, and it has yielded satisfactory crops from the first trial, which was made three years ago. We can recommend this variety to all. It has a short stiff straw, stands up well and yields much better than its appearance would indicate. The grain is yellowish white, small and plump, and makes good flour. Clawson wheat was sown on a quarter of an acre of good ground; it grew finely and yielded 530 lbs. of beautiful white wheat, which is at the rate of 35 bushels an acre. This variety promises well, and we have sowed several acres with it for next year's crop.

The oats and rye we can give no report upon, as they are not threshed, and the oats is damaged so that we cannot hope for any important conclusions.

The corn was planted on the best ground of the farm, and up to the end of June was most promising; so that there was reason to look for a heavy crop; but it will not average 25 bushels an acre, and perhaps not 20 bushels.

Potatoes were planted on good ground, and manured with special fertilizers, but for lack of rain they failed entirely.

Mangold wurzels were planted on something over an acre of good and highly manured ground. Many of the seeds failed, and many plants died from the drouth. Those which stood have grown rapidly since the middle of September, and we have a crop of about 300 bushels.

Carrots were planted on nearly two acres of ground. Like all other crops they have suffered from dry weather; many plants were killed, and of those which stood most are small and rough. Only about 150 bushels have been secured. The market for them is good and we regret that we cannot supply the demand.

Cabbages have failed for lack of time to grow since September 17—though the plants are healthy, and with a few weeks more of time would make a fine crop.

Rutabagas are not a good crop this year; about 450 bushels from two acres. They grow slowly and need very rich soil.

Yellow stone turnips were planted in the vacancies in the beet and carrot fields, as well as by themselves. They have grown remarkably well. For cattle feed they are better and cheaper than any other root crop, and we shall increase our amount next year.

Our hay crop was a medium one, but on account of the short supply of other fodder we shall have to feed it all up.

Corn fodder which we depend on for our summer's soil-feeding of the cattle, as well as for the winter's supply, was an entire failure.

The value of the crops lost by drouth on the farm this season cannot be less than \$1,000.

REPORT OF RUTGERS SCIENTIFIC SCHOOL. 21

EXPERIMENTS UPON THE GROWTH OF INDIAN CORN WITH VARIOUS FERTILIZERS, IN THE SEASON OF 1876.

The experiments were made on a red shale soil, rather hard and stubborn. It had been a meadow in good condition for four years, but the grass had run out, and it was ploughed up to be tilled and reseeded. It was judged to be of uniform quality, though from the experiments it may be inferred that some portions were more sensitive to drouth than others. The corn was planted in hills $3\frac{1}{2}$ feet apart each way, and with three or four grains in a hill. After planting, the fertilizers were applied on the hills, but scattered about somewhat. The plots were of one-tenth of an acre each. The fertilizers used upon the several plots, and their rates per acre, are given in the following table, as follows:

FERTILIZERS.	NUMBERS OF THE PLOTS.								
	1	2	3	4	5	6	7	8	9
Plain super-phosphate of lime, in pounds.....		500	.....	.....	300	500	.....	.....	.....
Sulphate of ammonia, in pounds.....	300	.....	.....	.....	200	100	.....	.....	.....
Muriate of potash, in pounds.....			150	.....	150	150	.....	.....	.....
Mixed potash salts, in pounds.....							150	.....	.....
Forrester's corn fertilizer, in pounds								758	.....
Cost per acre, in dollars	\$14 64	\$10 00	\$3 57	\$0 00	\$19 34	\$18 45	\$1 50	\$18 00	\$0 00
Ears of corn per acre, in pounds.....	1700	1950	1950	2050	2200	2800	2400	2400	2200
Corn in bushels of 80 pounds each.. ..	21	24	24	26	27	35	30	30	27
Stalks in pounds, per acre.....	3250	3050	2950	2950	3150	3600	3350	3070	3000

There are no satisfactory inferences to be drawn from these results, and were it not for the regular continuance of the series of experiments on Indian corn, which have been continued for five years in succession, these might have passed without record.

The experiments have had for one object, the proving the effect of muriate of potash on the growth of corn and stalks.(a)

In the absence of any results here, it is satisfactory to present the result of an experiment of the same kind, which is conclusive, and was made in Warren county, just opposite Beatyestown, in Warren county, by the Hon. Aaron Robertson. His letter

(a) The experiments with this fertilizer for the several years are here repeated—the results being in bushels of corn and pounds of stalks per acre.

Year.	MUR. POTASH.			NO MANURE.	
	Lbs. per acre.	Bush. corn.	Lbs. of stalks.	Bush. corn.	Lbs. of stalks.
1872.	250	69	7104	69	6000
1873.	250	59	4646	64	3945
1874.	100	57	3787	48	3312
1875.	100	100	6150	85	5500
1876.	150	24	2950	26	2950

These experiments show that muriate of potash increases the weight of the corn stalks. The soils on the trial plots of 1872-3 & 6, were quite as good as that of the plots of 1875, and the differences in the crops are, judging from the tables of rain fall, owing to the greater or less amount of rain in July and August.

giving a full and clear statement of his experiment and the result is here presented.

BEATYESTOWN, October 21st, 1876.

DOCT. GEO. H. COOK—*Dear Sir*:—About the 11th of May last, I applied five hundred pounds of muriate of potash, purchased of H. J. Baker & Brother, No. 215 Pearl Street, New York, on five acres of corn planted the 5th of May, on the hill, before the corn came up. A moderate rain fell three or four days afterwards, which washed the muriate into the ground so that but little appeared on the surface. On the 21st of May, perhaps the heaviest rain of the last forty years fell in the afternoon, which left the whole surface of the ground, corn included, nearly covered with water the next morning. This was followed by another heavy rain on the afternoon of the 22d. It was expected that the corn would require entire replanting, but after two or three days it was found that what remained was alive, and it was only replanted where it was washed out.

The season afterwards was dry, reaching at length to an extreme drought.

About three acres of the land was originally the outlet of a swamp containing springs of water, was nearly level, with a hard-pan bottom of nearly white clay and thin soil, but had been drained by deep open ditches, which has diverted the spring water entirely. Corn had only been planted on it once in forty years, (in 1873)

The remaining two acres was land of good quality, being a drift soil on the top of the limestone on the bank of the Musconetecong creek.

Adjoining the two acres was a strip of the same kind of land upon which no muriate or other manure was applied, and the muriate was applied on all the hard pan land planted

Equal quantities, about one-third of an acre each, of the corn on the drift soil, where the muriate was and where it was not applied, was cut and husked separately, and the increase of the quantity where the muriate was applied was about one-fourth. The stalks were not weighed, but apparent increase on the manured land was fully equal to that of the corn.

On the hard-pan land there was no opportunity for comparison, excepting with the crop of 1873, which was a good season, but it was apparent that the benefit was much greater than on the drift; notwithstanding the drouth, the crop was much larger than that of 1873. The superior thrift of the manured corn was plainly seen the whole season; while the other corn rolled every day during the dry weather, this remained fresh with expanded leaf.

The experiment was made under the most adverse conditions on account of the flood, which, although it was not deemed

advisable to replant over the whole ground, reduced the number of stalks fully one fourth, and on account of the want of rain afterwards which shortened the crop seriously, so that a statement of the yield per acre would do injustice both to the muriate and to the land, I feel certain, however, that the value of the manure was much beyond the expense.

Truly yours,

AARON ROBERTSON.

EXPERIMENTS UPON THE GROWTH OF WHEAT WITH DIFFERENT FERTILIZERS, IN THE SEASON OF 1875-6.

These experiments were made upon a large field of twelve acres, and the results were obtained by taking the crops from a square rod of that which had been enriched by each fertilizer, taking them all from a strip across the field which was judged to be of uniform quality. The field was formerly the poorest on the farm, and although it has been underdrained and manured it is still somewhat lacking in mellowness of soil, and the sub-soil is not uniform in texture, being very hard and close in some places, and more open in others. And this variation is so irregular and so frequent, that it is scarcely possible to avoid its ill effects. The wheat grown was the Fultz variety. The following fertilizers were tried, and with the results here stated per acre.

FERTILIZERS.	NUMBER OF PLOTS.							
	1	2	3	4	5	6	7	8
Size of plots in acres.....	1.66	1.	1.	1.	1.	.5	.5	5.33
Lister's super-phosphate of lime, pounds.....	300							
Plain super phosphate of lime, pounds.....		200	200	400	200			200
Suphate of ammonia, pounds.....		100	200	100	100			
Muriate of potash, pounds.....					100	100		
Gypsum, pounds.....						200		
Dried blood, pounds.....								100
Cost per acre, in dollars.....	\$5.00	\$8.00	\$12.75	\$11.00	\$10.00	\$3.25		\$5.00
Wheat per acre, bushels.....	48	40	34	40	40	40	37	40
Straw, pounds.....	4320	4450	4640	4000	4160	3040	4160	5120

The crop of wheat upon this field was very fine, as can be seen from these trial plots. It is not all threshed yet, so that the whole crop cannot be given at present. It is our first attempt at experiments with fertilizers upon wheat. The method of growing, harvesting and threshing wheat, renders it more troublesome to get accurate results, than with corn or potatoes. In this case, the plots measured and weighed were too small, and so not as reliable as larger ones would have been; an error in any of them being necessarily magnified one hundred and sixty times.

The experiment upon oats with muriate of potash was not carried out, on account of the partial failure of the crop.

Experiments with potatoes and various fertilizers were fully tried, but nothing instructive can be deduced from them. This is to be regretted, for beside the labor lost, there were one or two of Forrester's fertilizers tried in the comparison with others, and published reports upon them are expected, but none can be given now.

FERTILIZERS.

There have been a number of chemical and other fertilizers used or brought for us on the College Farm during the past year. Analyses of some of them are herewith presented.

"*National Soluble Bone*," from the U. S. Fertilizing and Chemical Company, Camden.

This is a super-phosphate of lime made from Carolina phosphate. It contains no ammonia, and is prepared so as to supply farmers or manufacturers with an article that can be ammoniated to suit the uses to which it is to be put. A ton was given to the College Farm by the manufacturers, and it was used on various crops; but on account of the season, no report can be given of its effects, except that the turnips on which it was put grew very fast at the end of the season, after the rains came.

ANALYSIS.

Phosphoric acid, soluble in water,	-	-	-	-	8.32
" " " in citrate of ammonia,	-	-	-	-	3.52
" " insoluble,	-	-	-	-	5.12
Water,	-	-	-	-	10.00

The percentage of soluble and reverted phosphoric acid in this is 11.84; other specimens have been examined that contained 15 per cent. of these. With these percentages, the fertilizer is a good one.

Standard Super-Phosphate of Lime, from Messrs. Lister Brothers, Newark, N. J.

This is a super-phosphate made from bones, partly raw and partly burned. It contains the elements of ammonia of the bone, and is ready for use: and it is intended to be of a uniform standard. Two tons were sent to the College Farm to be used on crops, and they were so used; but the lack of rain prevented its proper action, and no detailed report can be made of the experiment, except to say that the fertilizer was very quick in its action on turnips this autumn, and they are of fine quality.

ANALYSIS.

Phosphoric acid, soluble in water,	-	-	-	-	9.63
“ “ “ in citrate of ammonia,	-	-	-	-	2.90
“ “ insoluble,	-	-	-	-	1.85
Potash,	-	-	-	-	1.74
Ammonia,	-	-	-	-	2.77

This is a good and cheap fertilizer, and is sold very extensively.

Popplein's Silicated Super-phosphate of Lime, is a new fertilizer made from plain super-phosphate, by adding to it infusorial earth and potash salts. The infusorial earth is soluble silica, mixed with more or less sand. It has long been a popular notion that soluble silica would tend to stiffen straw, and strengthen the growth of stems and leaves, and so promote the healthy growth of vegetation. The fertilizer mentioned above, is prepared in accordance with this hypothesis. The printed circular accompanying the fertilizer states that it is composed of 800 pounds super-phosphate of lime, 800 pounds of infusorial earth, and 400 pounds of potash salts. Our analysis of the sample sent is as follows:

ANALYSIS.

Phosphoric acid, soluble in water,	-	-	-	-	2.18
“ “ “ in citrate of ammonia,	-	-	-	-	1.15
“ “ insoluble,	-	-	-	-	3.33
Potash,	-	-	-	-	4.34
Soluble silica,	-	-	-	-	8.50
Water,	-	-	-	-	7.50

The remainder consisting of sulphuric acid, lime, magnesia, sand &c., not used in computing the value of a high priced fertilizer, was not weighed. We shall wish to experiment with infusorial earth on growing crops before undertaking to assign a value to fertilizers containing it; and hope to learn of decisive experiments in the course of the coming year.

Lacustrine is the name given to a fertilizer which was brought to our attention as something of value to farmers. It was said to be a natural product, and was without analysis. Its price in New York is from \$10 to \$13 a ton, according as it is in bulk or in bags.

It is really a shell marl, such as accumulates in the bottom of ponds, swamps &c., in limestone districts. In large dressings it is a most excellent fertilizer, but it should not be offered as a commercial fertilizer, for it will not bear much expense of transportation.

Muriate of Potash.—Our supply for this year was obtained from

H. J. Baker & Brother, of 215 Pearl street, N. Y. It contained 84 per cent. of the pure substance. Its price was $2\frac{1}{4}$ cents a pound; and as 84 of muriate of potash is equivalent to 53 of potash, an easy calculation shows that potash in it is worth 4.2 cents per pound. This is cheaper than it can be bought in the common german potash salts, and is probably the lowest price at which potash is sold at present.

Actual Potash.—This is a mixture of muriate, carbonate and sulphate of potash, sold by dealers for a fertilizer. It is probably a by-product from some chemical works. It contained 45 per cent. of potash, and its price was 3 cents a pound. Calculated from this substance, which is also a low priced quality of potash salt, the cost of potash in fertilizers is $6\frac{2}{3}$ cents a pound. This is considerably more than its cost in muriate of potash. It is perhaps a little milder than the muriate, in its effects on vegetation, and so may be safer. It was tried in our experiments on Indian corn, but all conclusions were prevented by the dry weather.

Sulphate of Ammonia.—The price of this fertilizer was $4\frac{3}{4}$ cents a pound, and it contained 25 per cent. of ammonia. This is equivalent to 19 cents a pound for ammonia.

Super-Phosphate of Lime—The prices of phosphoric acid soluble in water, and of that soluble in citrate of ammonia, were computed last year from super-phosphate of lime containing 10 per cent. of soluble phosphoric acid, and costing \$25 a ton. The prices deduced in this way were, for the first, $11\frac{1}{2}$ cents a pound, and for the last, 10 cents. There has been no important change in the price of the super-phosphate during the year.

The price of *insoluble phosphoric acid* in bones was computed at 5 cents a pound, and no price was given for that in phosphatic rock.

Peruvian Guano—Three bags of Peruvian guano were sent by Chas. V. Mapes, of 158 Front street, New York city. Two of the bags were marked "*Guaranteed,*" and one marked "*Rectified.*"

The *guaranteed guano* is Peruvian guano which has been screened, the lumps ground, and the whole cargo then carefully mixed so as to make it uniform in quality, and analyzed. The price is then determined by the quantities of ammonia, phosphoric acid and potash in it. By this means the farmer is secured a fertilizer of uniform quality, and is enabled to select from the different cargoes offered such as contain the quantities of ammonia or phosphoric acid best suited to his soil or crops. Of the two bags sent, one has its principal value in the ammonia it contains, and the other in its phosphoric acid.

The *rectified guano* is Peruvian guano which has had sulphuric acid added to it to hinder the ammonia from evaporating, and

to make the phosphoric acid dissolve easier. It is in excellent mechanical condition, and has been approved by agricultural chemists as a fertilizer in the best form, and of the lowest price, for intelligent farmers.

	Guaranteed.		Rectified.
	1	2	
Phosphoric acid, soluble in water, -	5.76	4.61	12.67
“ “ insoluble in water, -	13.70	13.57	
Ammonia, - - - - -	9.37	6.42	10.56
Potash, - - - - -		2.90	1.80

Forrester's Potato Fertilizer.—This fertilizer was used on our potatoes in 1875 with success. This, as well as his *corn fertilizer*, were tried this year, but as the crops were ruined by extreme dry weather, no results can of course be expected. The analysis of the potato fertilizer was given last year as follows :

ANALYSIS.

Phosphoric acid, soluble in water, - - - -	3.07
“ “ “ in citrate of ammonia, - - -	3.01
“ “ insoluble, - - - - -	.83
Potash, - - - - -	11.70
Ammonia, - - - - -	1.00
Lime, - - - - -	8.61
Sulphuric acid, - - - - -	15.85

The Corn Fertilizer was not analysed. These fertilizers are samples of compounds which inquiring and intelligent agriculturalists are making, to find those which will best suit their soils and crops, and which can be made at the least cost. The Stockbridge fertilizers are of this kind.

Leached Wood-ashes.—Several samples of leached wood-ashes have been received for analysis. This is one of Canada ashes. It is sold in New York city, and delivered by canal boats. It is an approved fertilizer, and some new interest may be felt in its analysis on account of the questions which have been asked regarding the importance of soluble silica, of which it contains 5 per cent.

ANALYSIS.

Carbonate of lime, - - - - -	70.5
Soluble silica, - - - - -	5.1
Phosphoric acid, - - - - -	1.6
Potash, - - - - -	a trace
Magnesia, - - - - -	2.5
Ox. Iron and Alumina, - - - - -	6.5
Sand, - - - - -	2.3
Water, by loss, - - - - -	11.5
	<hr/> 100.0

PRICES OF FERTILIZERS.

The prices of fertilizers which we have paid, and which we think are as low as they can be got in market, have been stated under the different analyses of fertilizers. They are for—

Ammonia, - - - - -	per pound,	19 cents
Phosphoric acid, soluble in water, - -	"	11½ "
" " " in citrate of ammonia, "	"	10 "
" " " in bone dust, - "	"	5 "
Potash, in muriate of potash, - - - -	"	4½ "

The value of a fertilizer can be computed from these prices, and then noting how it compares with the prices at which fertilizers are sold. An analysis usually gives the number of pounds of each constituent in 100 pounds of the fertilizer; of course twenty times the analysis gives the weights of each part in a ton. These latter weights multiplied by their prices in the above list give their values, and the sum of these values is that of the fertilizer.

This way of reckoning may be shortened by multiplying the prices above given by twenty, and then multiplying these products into the weights or percentages given in the analysis. Thus the above prices in the table, multiplied by twenty, give for—

Ammonia, - - - - -	\$3 80
Phosphoric acid, soluble in water, - - - -	2 30
" " " in citric acid, - - - -	2 00
" " " in bone dust, - - - -	1 00
Potash, in muriate potash, - - - -	0 90

Dealers in fertilizers use these instead of the prices per pound, and designate them as the prices for each *unit* per ton of 2,000 lbs.: thus, guano containing 12 per cent. of ammonia, would be worth 12 times \$3 80 per ton for its ammonia—and a super-phosphate containing 10 per cent. of soluble phosphoric acid would be worth \$23 a ton for that substance.

The *rectified guano* is offered in New York at \$3.50 for each *unit* of ammonia.

\$2.50 " *unit* of soluble phosphoric acid.

\$1.50 " *unit* of potash.

The *guaranteed guano* is offered at \$3.50 for each *unit* of ammonia.

\$2.00 " *unit* of soluble phosphoric acid.

\$1.60 " *unit* of reverted " "

\$0.40 " *unit* of insoluble " "

\$1.50 " *unit* of potash.

DONATIONS.

One ton of "National Soluble Bone," from the United States Fertilizing and Manufacturing Co., Camden, N. J.

Two tons of "Standard Bone Phosphate of Lime," from Messrs. Lister Brothers, Newark, N. J.

One cask; 400 lbs. "Sulphate of Potash," from W. H. C. Onderdonk & Co, Manufacturing Chemists, Newark, N. J.

One barrel each of "Forrester's Potato and Forrester's Corn Fertilizers," from H. J. Baker & Bro., 215 Pearl street, New York.

Three bags of "Peruvian Guano," from Chas. V. Mapes, Esq., 158 Front street, New York.

One barrel of "Infusorial Earth," the vegetable silica of some, from D. Judson Cook, Esq., of Drakeville, N. J.

Five bags of "Popplein's Silicated Phosphate of Lime," from

One thorough bred Short Horn Bull, two months old, from W. E. Skinner, Esq., Hamburg, N. J.

Three Jersey-red Pigs, two month's old, received at a reduced price, from Elmer Duell, Esq., Woodstown, Salem, county, N. J.

A stock of Black Bass, for the college farm pond, from the New Jersey Fish Commissioners, through J. R. Shotwell, Esq., of Rahway.

The Trustees of Rutgers College gratefully acknowledge these liberal donations from the friends of Scientific Agriculture. While the first reward to a generous giver must be in the pleasure of bestowing timely and appropriate gifts, it is hoped a profitable return may also come to them in our case, from the analyses and experiments made and published here, and from their exhibition to visitors at the farm.

It is intended to make these public acknowledgments for all gifts—and we take this occasion to correct an error in the report of 1875, in regard to the gift of a large quantity, a half ton of blood guano, received from the Manhattan Fertilizing Co., of New York.

STOCK.

One team each of horses and mules upon the farm are the same as last year. A single horse for the milk wagon is also used.

The cows, fifteen in number, are nearly the same as last year. They are kept in the stables, mostly, and are fed with green fodder, corn stalks, straw and some hay. Mangold wurzels and turnips, with bran, indian meal, malt-dust, or other feed are also fed to them. Calves enough are raised to keep up the stock of

Ayrshire cows. No butter or cheese is made, all the milk being sold to families in New Brunswick. The Ayrshire cows are pure blooded though they are not in the Herd Book. They are all from stock imported by the late Capt. E. Nye, of Newark, or of A. M. Tredwell, of Madison, N. J., and can easily be traced back to the importation. We have this year purchased a fine thorough-bred Ayrshire Bull, "Toro," 1506—4th vol. Ayrshire Herd Book, four years old, from Mr. Tredwell.

Toro's sire, "Logan," grand sire, "Angus," imported. Toro's dam, "Lady Ayr," grand dam, "Flora Gray," g. grand dam, "Mary Gray," imported. Logan's dam, "Annie," grand dam, "Beith," imported. Lady Ayr's sire, "White Lilly's Kilburn," grand sire, "Kilburn," imported.

Lady Ayr gave in June, 1872, twenty-five and a half quarts of milk per day.

The short horn bull calf, "DUKE OF NEW BRUNSWICK," roan—bred by William E. Skinner, Esq., Hamburgh, N. J., and by him presented to the New Jersey State Agricultural College, Sept. 11, 1876—calved July 30, 1876. Got by Roan Duke 8959, out of Candidissima (vol. 15), by White Plume, 15713—Countess of Meadowside by Roan Duke, 8959—Countess of Lonsdale by Brancroft, 5341—Duchess of Lancaster by Grand Duke of Oxford, 3988—Lucy, by Zouave, 2465—Lizzie, by Wallace, 179—Betty, by Sultan, 164—Diana, by Leopard, 188, (4213)—Matilda, by White Jacket, (5647)—Hart, bred and imported by Humphrey Hollis in 1821, and sired by Wellington, bred by Charles Colling." This animal is now doing well and promises to be a fine specimen of the breed.

THE SWINE upon the farm and from which it is proposed to breed, are the Jersey Reds. This breed of hogs has long been known and appreciated in the counties of Monmouth, Burlington, Gloucester and Salem. Thos. Gordon in 1834, says of these counties, "that few portions of the United States, of equal area, produce more or better pork," and Smith's History says, "that pork was a staple of Burlington produce in 1765." This is the breed from which the pork has been produced. It has been improved by careful selection and management and holds its place well among the improved large breeds. The farm stock came from Salem county, and was selected by Omar Borton, of Woodstown. He informs me that two animals of this breed were slaughtered there last February, when sixteen months and twenty-five days old, and their weights, including all the fat, were respectively, 723 and 628 pounds. Another slaughtered at the same time, at eleven months old, weighed 400 pounds. And three others slaughtered there at about the same date, and eighteen months old, weighed 498, 478 and 424 pounds. They are easy keepers, grow rapidly, and possess great vigor of constitution.

BUILDINGS.

The barn upon the farm was of the Dutch style, and very old ; probably much beyond a hundred years. The roof had become so entirely decayed that no one could venture on it to make repairs, and as it leaked badly, so as to damage the hay and grain in it, there was no choice but to rebuild, hard as the times were. This work was done in the latter part of May, and the first half of June, so that the new barn could be used for storing the crops of hay and grain of this year. The outbuildings were moved into place and repaired in October, and all are now in satisfactory condition.

The barn is 60 feet long, 40 feet wide, and with posts 22 feet high. The main floor has on it stabling for 7 horses, feed room, large threshing floor and hay. There is a cellar under the whole, the bottom of which is level with the cattle yard on the south side. There are stanchions in it for 17 cows, and cellar room for roots, and for large store of cut straw, hay or stalks. Water is supplied from the city water works for the stables and the yard.

The L barn stands on a level with the cow yard, on its west side, and laps on the large barn about 6 feet, is 48 feet long, 26 feet wide, and has 18 feet posts. In its lower part is room for a horse, milk wagon, and for loading cans of milk ; a pen for a bull, pens for calves, and some open shed room. The upper part is for hay and straw.

The plough house stands on the south side of the cow yard, but on a level with the barn floor, and the farm road which runs along the east side of the yard. The building is 30 feet long, 15 feet wide, and has 14 feet posts. It is floored to hold the ploughs, cultivators, harrows, and other farm implements. It stands on walls, so as to form a shed underneath, open to the cattle.

The piggery is 24 feet long, 18 feet wide, and has 14 feet posts. It has in it 5 pens for pigs, with convenient passage ways and feeding troughs, and openings out to small yards. There is room for a shop or a store room over the pens.

The carriage house is 20 feet long, 18 feet wide, and has 11 feet posts. It has room for 2 carriages, and includes also, the original corn crib for the farm.

The poultry houses are small, only 6 feet long, by 8 feet wide, and intended for a small number of fowls.

The corn crib is 40 feet long, 8 feet high, besides the roof ; 4 feet wide at bottom, and 6 feet wide at the top. It stands on posts about 2 feet above the ground. Its siding is shingling lath placed about an inch apart.

The "Old Barn" is 40 feet long, 26 feet wide, and has 17 feet posts. It was built originally for keeping horses, but is now

used for storing tools, seeds, and fertilizers, and the upper part will be used for a granary. There is an open wagon shed at the south end 26 feet long, and 14 feet deep.

This improvement in buildings has long been needed, and it is satisfactory to now have it done. There is sufficient room to store the crops, shelter the stock, and to work with the least loss of time or labor. In favorable seasons, the buildings will all be filled.

The condition of the farm is such now, that it will with reasonable economy, more than meet the current expenses of ordinary good farming. But it is desirable for the interests of New Jersey agriculture, that it should do much more than this. It is ready for experiments on fertilizers, on tillage, on crops, on feeding, or on any part of rural economy, whereby science can lighten labor, or increase its rewards. Such experiments cost money, educated skill, and patient work, and these must be provided as rapidly as possible.

COURSES OF STUDY.

Three distinct courses of study are included in the Schedule which follows :

- I. A COURSE IN CIVIL ENGINEERING AND MECHANICS.
- II. A COURSE IN CHEMISTRY AND AGRICULTURE.
- III. A SPECIAL COURSE IN CHEMISTRY.

During the first and second years the studies of the two full courses are the same, and are designed to furnish a suitable introduction to the pursuit of the higher branches in either.

During the last two years the subjects of Higher Mathematics, Mechanics and Engineering in the Engineering Course are replaced by Analytical Chemistry, practice in the Laboratory, and Agriculture in the other. The remaining subjects are pursued by the students of both courses together.

The course of study for the first two years in this Department is arranged so as to be complete in itself. It is especially designed to meet the wants of those who cannot take the entire four years' course, but who desire to fit themselves as Land Surveyors. Students leaving at this period of the course, receive from the Faculty a certificate of their attainments.

SPECIAL STUDENTS are received, and allowed to take any part of the above course; and particular provision is made for them, especially in the Laboratory, in Mathematics and Surveying.

THE SPECIAL COURSE in Chemistry and Agriculture, occupying two years, is designed for those who wish to devote themselves exclusively to these branches. Opportunities of a very superior character are afforded to such students under the charge of Professors Cook, Smock and Van Dyck, in the new Laboratory building.

SPECIAL PROVISION IS ALSO MADE FOR STUDENTS WHO DESIRE, AFTER COMPLETING THE REGULAR COURSE OF STUDY, TO TAKE POST-GRADUATE STUDIES.

COURSE OF STUDY.

FRESHMAN YEAR.

Exercises during the year in Composition and Declamation. Bible Class each Sabbath morning.

FIRST TERM.

1. French. 2. Mathematics—Loomis' Algebra, from Quadratic Equations. 3. Natural History—Dalton's Physiology; Lectures. 4. Rhetoric—Haven; Lectures. 5. Draughting—Construction of Problems.

SECOND TERM.

1. French. 2. Mathematics—Loomis' Geometry, from Book IV. 3. Natural History—Zoology; Lectures. 4. Elocution—Lectures. 5. English Literature—Shaw's Manual; Craik's English of Shakespeare. 6. Draughting.

THIRD TERM.

1. French. 2. Mathematics—Loomis' Trigonometry, Plane and Spherical. 3. Natural History—Gray's Botany; Lectures. 4. English Literature—Shaw's Manual; Lectures. 5. Draughting.

SOPHOMORE YEAR.

Exercises during the year in Composition and Declamation. Bible Class each Sabbath morning.

FIRST TERM.

1. Surveying—Murray's Manual; Field Exercises and Mapping. 2. Descriptive Geometry—Church. 3. Chemistry—Lectures. 4. Mental Philosophy—Haven. 5. History—Freeman's Outlines.

SECOND TERM.

1. Descriptive Geometry—Church ; Construction of Problems.
2. Chemistry—Lectures.
3. Mental Philosophy—Haven.
4. History—Freeman's Outlines.

THIRD TERM.

1. Leveling and Railroad Curves—Henck's Field Book ; Field Practice and Plotting.
2. Shades, Shadows and Perspective—Church ; Construction of Problems.
3. Chemistry—Lectures.
4. Mental Philosophy—Lectures.
5. History—Creasy's Constitutional History of England.

JUNIOR YEAR.

COURSE IN CIVIL ENGINEERING AND MECHANICS.

*Exercises during the year in Composition and Original Declamation.
Bible Class each Sabbath morning.*

FIRST TERM.

1. German.
2. Analytical Geometry—Peck.
3. Natural Philosophy—Snell's Olmsted.
4. History of Civilization—Guizot.
5. Constitutional History of the United States—Text book and Lectures.
6. Draughting.

SECOND TERM.

1. German.
2. Differential and Integral Calculus—Peck.
3. Natural Philosophy—Snell's Olmsted.
4. Political Economy—Bowen and Perry.
5. Constitutional History of the United States—Text book and Lectures.
6. Draughting.

THIRD TERM.

1. German.
2. Mechanics—Bartlett or Smith.
3. Astronomy—Loomis.
4. International Law—Woolsey.
5. Draughting.

JUNIOR YEAR.

COURSE IN CHEMISTRY AND AGRICULTURE.

*Exercises during the year in Composition and Original Declamation.
Bible Class each Sabbath morning.*

FIRST TERM.

1. German. 2. Mineralogy and Analytical Chemistry—Text book, with Laboratory Practice. 3. Agriculture—Lectures at the Farm. 4. Natural Philosophy—Snell's Olmsted. 5. History of Civilization—Guizot. 6. Constitutional History of the United States—Text book and Lectures.

SECOND TERM.

1. German. 2. Analytical Chemistry—Text book, with Laboratory Practice. 3. Agriculture—Lectures. 4. Natural Philosophy—Snell's Olmsted. 5. Political Economy—Bowen and Perry. 6. Constitutional History of the United States—Text book and Lectures.

THIRD TERM.

1. German. 2. Analytical Chemistry—Text book, with Laboratory Practice. 3. Agriculture—Vegetable Physiology. 4. International Law—Woolsey.

SENIOR YEAR.

COURSE IN CIVIL ENGINEERING AND MECHANICS.

*Exercises during the year in Composition and Original Declamation.
Bible Class each Sabbath morning.*

FIRST TERM.

1. Mechanics—Bartlett or Smith. 2. Geodesy—Theory and

Practice of Triangulation. 3. Chemistry—Lectures on Organic Chemistry. 4. Moral Philosophy—Wayland and Hopkins.

SECOND TERM.

1. Engineering—Mahan. 2. Geodesy—Practical Astronomy; Indeterminate Analysis. 3. Chemistry—Lectures on Chemical Physics. 4. Moral Philosophy—Butler's Analogy.

THIRD TERM.

1. Engineering—Bridge Building and Railway Practice. 2. Architecture—Lectures. 3. Geology—Lectures; Geological Excursion. 4. Moral Philosophy—Butler's Analogy.

SENIOR YEAR.

COURSE IN CHEMISTRY AND AGRICULTURE.

*Exercises during the year in Composition and Original Declamation.
Bible Class each Sabbath morning.*

FIRST TERM.

1. Mining and Metallurgy. 2. Chemistry and Principles of Agriculture—Lectures. 3. Laboratory Practice. 4. Moral Philosophy—Wayland and Hopkins.

SECOND TERM.

1. Agriculture—Its Methods and Products. 2. Chemistry—Lectures on Chemical Physics. 3. Laboratory Practice. 4. Moral Philosophy—Butler's Analogy.

THIRD TERM.

1. Agriculture—Animal Physiology; Care and Management of Domestic Animals. 2. Architecture—Lectures. 3. Geology—Lectures; Geological Excursion. 4. Moral Philosophy—Butler's Analogy.

SPECIAL COURSE IN CHEMISTRY.

FIRST YEAR—FIRST TERM.

1. Elements of Chemistry—Text book and Lectures.
2. Blowpipe Analysis.
3. Elements of Mineralogy.

SECOND TERM.

1. Physics and Chemistry—Text book and Lectures.
2. Chemical Analysis—Qualitative.

THIRD TERM.

1. Chemical Analysis—Qualitative and Quantitative.
 2. Vegetable Physiology.
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SECOND YEAR—FIRST TERM.

1. Chemical Analysis—Analysis of Minerals, Ores, &c.
2. Mineralogy—Determinative.

SECOND TERM.

1. Chemical Physics—Heat, Electricity, Magnetism, Galvanism and Electro-magnetism—Text book and Lectures.
2. Analysis of Fertilizers and Chemical Products.

THIRD TERM.

1. Lectures on Geology.
2. Chemical Analysis—Special Investigations.

NEW JERSEY STATE AGRICULTURAL COLLEGE.

LAWS RELATING TO ITS ESTABLISHMENT, INSTRUCTION IN IT, &C.

An Act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts.

1. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That there be granted to the several States, for the purposes hereinafter mentioned, an amount of public land, to be apportioned to each State, a quantity equal to thirty thousand acres for each Senator and Representative in Congress to which the States are respectively entitled by the apportionment under the census of eighteen hundred and sixty; *provided*, that no mineral lands shall be selected or purchased under the provisions of this act.

SEC. 2. *And be it further enacted*, That the land aforesaid, after being surveyed, shall be apportioned to the several States in sections or subdivisions of sections, not less than one-quarter of a section; and whenever there are public lands in a State subject to sale at private entry at one dollar and twenty-five cents per acre, the quantity to which said State shall be entitled shall be selected from such lands within the limits of such State, and the Secretary of the Interior is hereby directed to issue to each of the States in which there is not the quantity of public lands subject to sale at private entry at one dollar and twenty-five cents per acre, to which said State may be entitled under the provisions of this act, land scrip to the amount in acres for the deficiency of its distributive share; said scrip to be sold by said States and the proceeds applied to the uses and purposes prescribed in this act, and for no other use or purpose whatsoever; *provided*, that in no case shall any State to which land scrip may thus be issued be allowed to locate the same within the limits of any other State, or of any Territory of the United States, but their assignees may thus locate said land scrip upon any of the unappropriated lands of the United States subject to sale at private entry at one dollar and twenty-five cents, or less, per acre; *and provided further*, that not more than one million acres shall

be located by such assignees in any one of the States; *and provided further*, that no such location shall be made before one year from the passage of this act.

SEC. 3. *And be it further enacted*, That all the expenses of management, superintendence and taxes from date of selection of said lands, previous to their sales, and all expenses incurred in the management and disbursement of the moneys which may be received therefrom, shall be paid by the States to which they may belong, out of the treasury of said States, so that the entire proceeds of the sale of said lands shall be applied without any diminution whatever to the purposes hereinafter mentioned.

SEC. 4. *And be it further enacted*, That all moneys derived from the sale of the lands aforesaid, by the States to which the lands are apportioned, and from the sales of land scrip hereinbefore provided for, shall be invested in stocks of the United States, or of the States, or some other safe stocks, yielding not less than five per centum upon the par value of said stocks; and that the moneys so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished, (except so far as may be provided in section fifth of this act), and the interest of which shall be inviolably appropriated by each State which may take and claim the benefit of this act, to the endowment, support and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.

SEC. 5. *And be it further enacted*, That the grant of land and land scrip hereby authorized, shall be made on the following conditions, to which, as well as to the provisions hereinbefore contained, the previous assent of the several States shall be signified by Legislative acts:

First. If any portion of the fund invested, as provided by the foregoing section, or any portion of the interest thereon, shall, by any action or contingency, be diminished or lost, it shall be replaced by the State to which it belongs, so that the capital of the fund shall remain forever undiminished; and the annual interest shall be regularly applied without diminution to the purposes mentioned in the fourth section of this act, except that a sum not exceeding ten per centum upon the amount received by any State under the provisions of this act, may be expended for the purchase of lands for sites or experimental farms, whenever authorized by the respective Legislatures of said States.

Second. No portion of said fund, nor the interest thereon, shall

be applied, directly or indirectly, under any pretence whatever, to the purchase, erection, preservation or repair of any building or buildings.

Third. Any State which may take and claim the benefit of the provisions of this act, shall provide, within five years, at least not less than one college, as described in the fourth section of this act, or the grant to such State shall cease; and said State shall be bound to pay the United States the amount received of any lands previously sold, and that the title to purchasers under the State shall be valid.

Fourth. An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their costs and results, and such other matters, including State industrial and economical statistics, as may be supposed useful, one copy of which shall be transmitted by mail free, by each, to all the other colleges which may be endowed under the provisions of this act, and also one copy to the Secretary of the Interior.

Fifth. When lands shall be selected from those which have been raised to double the minimum in price, in consequence of railroad grants, they shall be computed to the States at the maximum price, and the number of acres proportionally diminished.

Sixth. No State, while in a condition of rebellion or insurrection against the government of the United States, shall be entitled to the benefit of this act.

Seventh. No State shall be entitled to the benefits of this act unless it shall express its acceptance thereof by its legislature within two years from the date of its approval by the President.

SEC. 6. *And be it further enacted,* That land scrip issued under the provisions of this act shall not be subject to location until after the first day of January, one thousand eight hundred and sixty-three.

SEC. 7. *And be it further enacted,* That the land officers shall receive the same fees for locating land scrip issued under the provisions of this act as is now allowed for the location of military bounty land warrants under existing laws; *provided,* their maximum compensation shall not be thereby increased.

SEC. 8. *And be it further enacted,* That the Governors of the several States to which scrip shall be issued under this act, shall be required to report annually to Congress all sales made of such scrip until the whole shall be disposed of, the amount received for the same, and what appropriation has been made of the proceeds.

Approved July 2, 1862.

An act accepting on the part of the State of New Jersey a grant of lands made by the United States to the several States and Territories, which may provide Colleges for the benefit of the Agricultural and the Mechanic Arts.

1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That an act of Congress of the United States, approved July second, A. D. eighteen hundred and sixty-two, entitled "An act donating public lands to the several States and Territories which may provide Colleges for the benefit of Agriculture and the Meehanic Arts," and the grant of land and land scrip thereby made, be and the same is hereby aeecepted on the part of the State of New Jersey.

2. *And be it enacted*, That the said grant of land and land scrip is hereby accepted for the purposes and upon the conditions in said act of Congress specified, and the assent of the State of New Jersey to the several conditions and provisions in said aet contained, is hereby signified and expressed.

3. *And be it enacted*, That the Governor of this State, and such persons as he shall appoint for that purpose, are hereby appointed commissioners to receive from the Secretary of the Interior, or other officer of the United States, the land scrip to which the State of New Jersey is or may be entitled, under the act of Congress aforesaid, said scrip to be held by said commissioners for the State, until provision is made by law for the sale thereof and investment of the proceeds in accordance with the provisions of said act of Congress.

4. *And be it enacted*, That this act shall take effect immediately.
Approved March 21, 1863.

An act appropriating scrip for the public lands granted to the State of New Jersey by the act of Congress, approved July second, one thousand eight hundred and sixty-two.

WHEREAS, the Governor of this State has received from the Secretary of the Interior the scrip for public lands granted to the State of New Jersey by an act of Congress of the United States, approved July second, one thousand eight hundred and sixty-two, and holds the same subject to such disposition as may be made by the Legislature; therefore,

1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That the Governor of this State, the Attorney General, the Secretary of State, the Comptroller, in ease such

office be created, and the Treasurer of the State, and their successors in office for the time being, be and they are hereby appointed commissioners to take charge of such scrip, and, as agents of the State, to sell and dispose of the same at such time or times, and in such mode as may appear to be most advantageous and safe; and in the name and on behalf of this State to convey and transfer the same to the purchaser or purchasers thereof, and to invest the avails thereof in the manner specially provided by said act of Congress.

2. *And be it enacted*, That said commissioners shall semi-annually pay over the interest of the fund which may result from the sale of said scrip, to the Trustees of Rutgers College, in New Jersey, for the special purposes and upon the special conditions hereinafter set forth.

3. *And be it enacted*, That said Trustees shall devote said interest wholly and exclusively to the maintenance, in that department of Rutgers College, known as Rutgers Scientific School, of such courses of instruction as (including the courses of instruction already established by said Trustees,) shall carry out the intent of said act of Congress, in the manner specially prescribed by the fourth section of said act.

4. *And be it enacted*, That said Trustees shall furnish gratuitous education in said courses of instruction to pupils of said school in such manner as the Legislature shall prescribe, the number of pupils to be so received gratuitously into said school, shall be in each year such a number as would expend a sum equal to one-half of the said interest for the same year, in paying for their instruction in said school, if they were required to pay for it at the regular rates charged to other pupils of said school, for the same year; said pupils so nominated and received shall be citizens of this State, and shall be admitted into said school upon the same terms, and subject to the same rules and discipline which shall apply to all other pupils of said school, with the single exception that they shall not be required to pay anything for their instruction.

5. *And be it enacted*, That said Trustees shall annually make and distribute the reports required by the fourth paragraph of section fifth of said act of Congress.

6. *And be it enacted*, That no portion of the said interest shall be paid over to said Trustees until they shall contract with this State, in such form as the said commissioners shall approve, to fulfill and perform all the duties and obligations imposed upon them by this act; *provided*, that the said board of trustees shall, in their corporate capacity, obligate themselves to erect additional and adequate buildings, as soon as the same may become necessary, without charge to or upon this State, and in like manner,

to furnish and provide a suitable tract of land conveniently located for an experimental farm.

7. *And be it enacted*, That there shall be appointed by the Governor, with the advice and consent of the Senate, a Board of Visitors, consisting of ten persons, two from each congressional district in this State, who shall hold their office respectively for five years, and who shall in the first instance be so appointed that the term of office of two of the said Board of Visitors shall expire each year, and the Governor shall in like manner appoint two, annually thereafter, and shall have power to fill all vacancies in the board; but the person so appointed to fill such vacancy shall only serve under such appointment until the next meeting of the Senate, and until an appointment shall have been made by the Governor, with the advice and consent of the Senate, and the person so appointed shall hold such office only for the unexpired term of the person whose place he is to supply, and it shall be the duty of the Board of Visitors to visit the said school at least twice in each year, and to make report thereon to the Legislature during the second week of the annual session.

8. *And be it enacted*, That the Board of Visitors shall possess general powers of supervision and control, and shall report to the Legislature such recommendations as to them may seem proper.

9. *And be it enacted*, That the said Board of Trustees shall cause to be delivered annually in each county of this State, one or more public lectures upon the subject of agriculture, free of charge.

10. *And be it enacted*, That the students of agriculture and the mechanic arts, shall be admitted into said college upon the recommendation of the board of chosen freeholders of their respective counties, and the number of students that a county shall at any one time be entitled to have in said college shall be equal to the number of representatives in the legislature to which such county is entitled, or in proportion to the same.

11. *And be it enacted*, That the legislature shall have power at any time hereafter to pass such laws as may be deemed necessary and proper to enforce the due execution of this act, and of the before mentioned act of Congress.

12. *And be it enacted*, That this act shall take effect immediately.

Approved April 4, 1864.

An Act to provide for Commissioners of the Agricultural College Fund, in pursuance of the provisions of the act of Congress, passed July second, eighteen hundred and sixty-two, entitled "An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts "

1. BE IT ENACTED, *by the Senate and General Assembly of the State of New Jersey*, That the Governor of the State, the State Treasurer, the Attorney General, the Secretary of State and Comptroller, in case said office be created, shall be Commissioners for the sale of the land scrip donated to this State by the United States, by virtue of the act of Congress hereinbefore referred to, and for the investment of the proceeds of such sale, who shall be known as "The Commissioners of the Agricultural College Fund;" they shall have power, and it shall be their duty to sell and assign said scrip, or portions of it, from time to time, as it may seem best for the interests of the State, until the whole of said scrip is sold, and an assignment endorsed on the back of a piece of land scrip, signed by said Commissioners, shall pass and convey to the purchaser or purchasers thereof, all the right and title and interest that the State of New Jersey shall have in the same at the time of such assignment; the Commissioners shall have power, and it shall be their duty, to invest the money received from such sales, in accordance with the act of Congress hereinbefore referred to; they shall have power to change said investments, and to re-invest such portions as may at any time be paid off, and it shall be their duty, so far as possible, to keep said fund and every portion of it in a productive condition; the bonds and other securities belonging to said fund shall be in the keeping of the State Treasurer, who shall be, *ex-officio*, Treasurer of the Commissioners; the Treasurer shall keep the accounts of this fund separate and distinct from all other accounts; the Commissioners shall make annually to the Legislature a detailed report of their doings under this act and of the state of said fund.

2. *And be it enacted*, That the expenses necessarily incurred by the Commissioners, in the discharge of their duties, shall be defrayed out of the Treasury of the State, upon the warrant of the Governor, said expenses, however, not to exceed two hundred and fifty dollars per annum, unless by virtue of a special appropriation for that purpose; and the Commissioners shall receive no compensation for their services.

3. *And be it enacted*, That this act shall take effect immediately.
Approved April 13, 1864.

An Act providing for the appointment of State Students to the
Agricultural Colleges.

1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That it shall be the duty of the State Superintendent of Public Schools to serve notice upon the Board of Chosen Freeholders in each of the counties of the State, at their annual meetings, requesting the appointment of a Board of Examiners in accordance with the eighth section of "An act to establish Public Schools," approved April seventeenth, eighteen hundred and forty-six, and if the Boards of Freeholders of any county neglect or refuse to appoint examiners as aforesaid, then it shall be the duty of the State Superintendent to appoint two or more discreet persons who shall constitute a Board of Examiners in and for said county, and who shall hold office until the next annual meeting of the Board of Freeholders for said county.

2. *And be it enacted*, That it shall be the duty of the Boards of Examiners of the several counties, in addition to the duties defined in the "Act to establish Public Schools," as aforesaid, to meet on the second Thursday of August of each year; *provided*, the State Superintendent so appoints, and proceed to examine such candidates for State scholarships at the agricultural college as may present themselves, and the candidates shall be subjected to such examination as the faculty of the said college and State Superintendent shall prescribe; and the candidates who shall receive certificates of appointment to the agricultural college in any one county, shall be those who obtain the highest average number respecting scholarship; and the number of certificates thus granted shall in no case exceed the number of State scholarships to which such county is entitled.

3. *And be it enacted*, That this act shall take effect immediately; all acts or parts of acts inconsistent with this act being hereby repealed.

Approved March 28, 1866.

Sec. 27 of "An act to establish a system of Public Instruction."

27. *And be it enacted*, That it shall be the duty of the County Superintendent, at such time and place as the State Superintendent may appoint, to examine such candidates for State scholarships at the agricultural college as may present themselves, and the candidates shall be subjected to such examination as the

faculty of the said college and the State Superintendent shall prescribe; and the candidates who shall receive certificates of appointment to the agricultural college in any one county, shall be those who obtain on such examination the highest average for scholarship; and the number of certificates thus granted, shall in no case exceed the number of State scholarships to which such county is entitled.

A Supplement to the act entitled "An Act Appropriating Scrip for the Public Lands granted to the State of New Jersey by the act of Congress approved July second, one thousand eight hundred and sixty-two," approved April fourth, one thousand eight hundred and sixty-four.

1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That the Board of Visitors to the Agricultural College of New Jersey shall hereafter consist of two members from each congressional district in this State under the present apportionment, to be nominated by the Governor with the advice and consent of the Senate.

2. *And be it enacted*, That the members of the Board of Visitors to the Agricultural College now in office shall continue to be members of the said board for the respective congressional districts in which they now reside until the expiration of the term for which they were appointed.

3. *And be it enacted*, That this act shall take effect immediately.
Approved January 29, 1873.

Supplement to the act entitled "An Act appropriating Scrip for the Public Lands granted to the State of New Jersey by the act of Congress, approved July second, one thousand eight hundred and sixty-two."

1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That the public lectures hereafter to be delivered by the State Agricultural College in the counties of this State, shall, as to number, time and place, be under the direction of the Board of Visitors of the State Agricultural College.

2. *And be it enacted*, That this act shall take effect immediately.
Approved February 27, 1873.

A Further Supplement to the act entitled "An Act Appropriating Scrip for the Public Lands granted to the State of New Jersey by the act of Congress, approved July second, one thousand eight hundred and sixty-two," approved April fourth, one thousand eight hundred and sixty-four.

1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That the term of office of members of the Board of Visitors to the Agricultural College of New Jersey shall hereafter be two years; *provided*, that this provision shall not apply to members appointed previous to the passage of this supplement.

2. *And be it enacted*, That the actual personal expenses of members of the Board of Visitors, incurred in the discharge of the duties imposed upon them by the act to which this is a supplement, shall be audited by the Comptroller and paid by the Treasurer of the State, out of any moneys unappropriated, on the certificate of the President and Secretary of the Board.

3. *And be it enacted*, That this act shall take effect immediately.
Approved March 26, 1873.

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